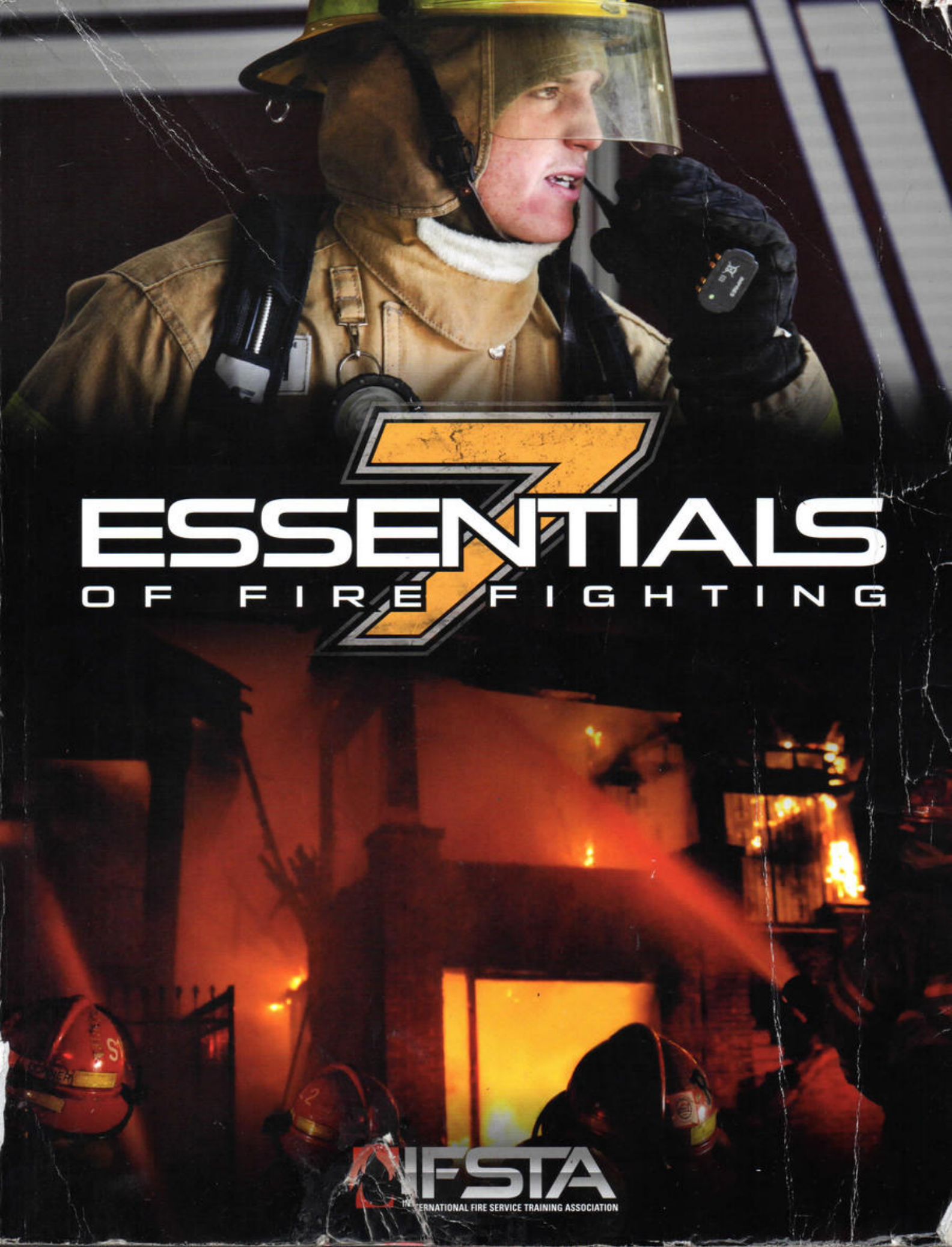

7 ESSENTIALS OF FIRE FIGHTING

IFSTA
INTERNATIONAL FIRE SERVICE TRAINING ASSOCIATION

Firefighter Code of Ethics

Background

The Fire Service is a noble calling, one which is founded on mutual respect and trust between firefighters and the citizens they serve. To ensure the continuing integrity of the Fire Service, the highest standards of ethical conduct must be maintained at all times.

Developed in response to the publication of the Fire Service Reputation Management White Paper, the purpose of this National Firefighter Code of Ethics is to establish criteria that encourages fire service personnel to promote a culture of ethical integrity and high standards of professionalism in our field. The broad scope of this recommended Code of Ethics is intended to mitigate and negate situations that may result in embarrassment and waning of public support for what has historically been a highly respected profession.

Ethics comes from the Greek word ethos, meaning character. Character is not necessarily defined by how a person behaves when conditions are optimal and life is good. It is easy to take the high road when the path is paved and obstacles are few or non-existent. Character is also defined by decisions made under pressure, when no one is looking, when the road contains land mines, and the way is obscured. As members of the Fire Service, we share a responsibility to project an ethical character of professionalism, integrity, compassion, loyalty and honesty in all that we do, all of the time.

We need to accept this ethics challenge and be truly willing to maintain a culture that is consistent with the expectations outlined in this document. By doing so, we can create a legacy that validates and sustains the distinguished Fire Service institution, and at the same time ensure that we leave the Fire Service in better condition than when we arrived.

Firefighter Code of Ethics

I understand that I have the responsibility to conduct myself in a manner that reflects proper ethical behavior and integrity. In so doing, I will help foster a continuing positive public perception of the fire service. Therefore, I pledge the following...

- Always conduct myself, on and off duty, in a manner that reflects positively on myself, my department and the fire service in general.
- Accept responsibility for my actions and for the consequences of my actions.
- Support the concept of fairness and the value of diverse thoughts and opinions.
- Avoid situations that would adversely affect the credibility or public perception of the fire service profession.
- Be truthful and honest at all times and report instances of cheating or other dishonest acts that compromise the integrity of the fire service.
- Conduct my personal affairs in a manner that does not improperly influence the performance of my duties, or bring discredit to my organization.
- Be respectful and conscious of each member's safety and welfare.
- Recognize that I serve in a position of public trust that requires stewardship in the honest and efficient use of publicly owned resources, including uniforms, facilities, vehicles and equipment and that these are protected from misuse and theft.
- Exercise professionalism, competence, respect and loyalty in the performance of my duties and use information, confidential or otherwise, gained by virtue of my position, only to benefit those I am entrusted to serve.
- Avoid financial investments, outside employment, outside business interests or activities that conflict with or are enhanced by my official position or have the potential to create the perception of impropriety.
- Never propose or accept personal rewards, special privileges, benefits, advancement, honors or gifts that may create a conflict of interest, or the appearance thereof.
- Never engage in activities involving alcohol or other substance use or abuse that can impair my mental state or the performance of my duties and compromise safety.
- Never discriminate on the basis of race, religion, color, creed, age, marital status, national origin, ancestry, gender, sexual preference, medical condition or handicap.
- Never harass, intimidate or threaten fellow members of the service or the public and stop or report the actions of other firefighters who engage in such behaviors.
- Responsibly use social networking, electronic communications, or other media technology opportunities in a manner that does not discredit, dishonor or embarrass my organization, the fire service and the public. I also understand that failure to resolve or report inappropriate use of this media equates to condoning this behavior.

The Firefighter Code of Ethics was developed through a cooperative effort between the Cumberland Valley Volunteer Firemen's Association, the National Society of Executive Fire Officers and the Congressional Fire Service Institute. (2012)

7 ESSENTIALS OF FIRE FIGHTING

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The International Fire Service Training Association (IFSTA) was established in 1934 as a *nonprofit educational association of fire fighting personnel dedicated to the advancement of fire fighting techniques and firefighter safety through training.* To carry out the IFSTA mission, Fire Protection Publications (FPP) was established at Oklahoma State University in the College of Engineering, Architecture and Technology. The primary purpose of FPP is to publish and distribute training materials as proposed, developed, and validated by IFSTA. FPP also develops state of the art teaching and learning materials to support the adoption and use of the manuals. The print products are supported by a full array of eBooks, online learning and apps.

IFSTA holds two meetings each year, one in January and one in July. During these meetings, selected committees of subject matter experts, who are acknowledged leaders in their fields, review draft materials and ensure that the content is accurate and meets the National Fire Protection Association professional qualification standards. These assemblies bring together individuals from several related and allied occupations:

- Fire department executives, training officers, and line personnel
- Educators from colleges and universities
- Representatives from governmental agencies
- Delegates of firefighter associations and industrial organizations

Validation committee members receive no fees for their work and their travel expenses are only partially funded by FPP. Members participate because of a personal commitment to the fire service and its future through training. Serving on a committee is prestigious in the fire and emergency response community. This unique process to validate the content of training textbooks creates a close relationship between IFSTA, the publications and the fire service community.

The manuals and associated instructional materials are the primary source of training and education for most fire departments and training agencies in North America, the U.S. Department of Defense, fire service related higher education programs, and other emergency response organizations worldwide. Some of the manuals are available in other languages including French, Arabic, Japanese and Chinese.

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Acknowledgments

This seventh edition of the IFSTA **Essentials of Fire Fighting** is intended to serve as a primary text for the firefighter candidate or as a reference text for firefighters who are already a member of a fire and emergency services organization. This manual addresses the fire fighting objectives found in NFPA 1001, *Standard for Fire Fighter Professional Qualifications*, 2019 Edition.

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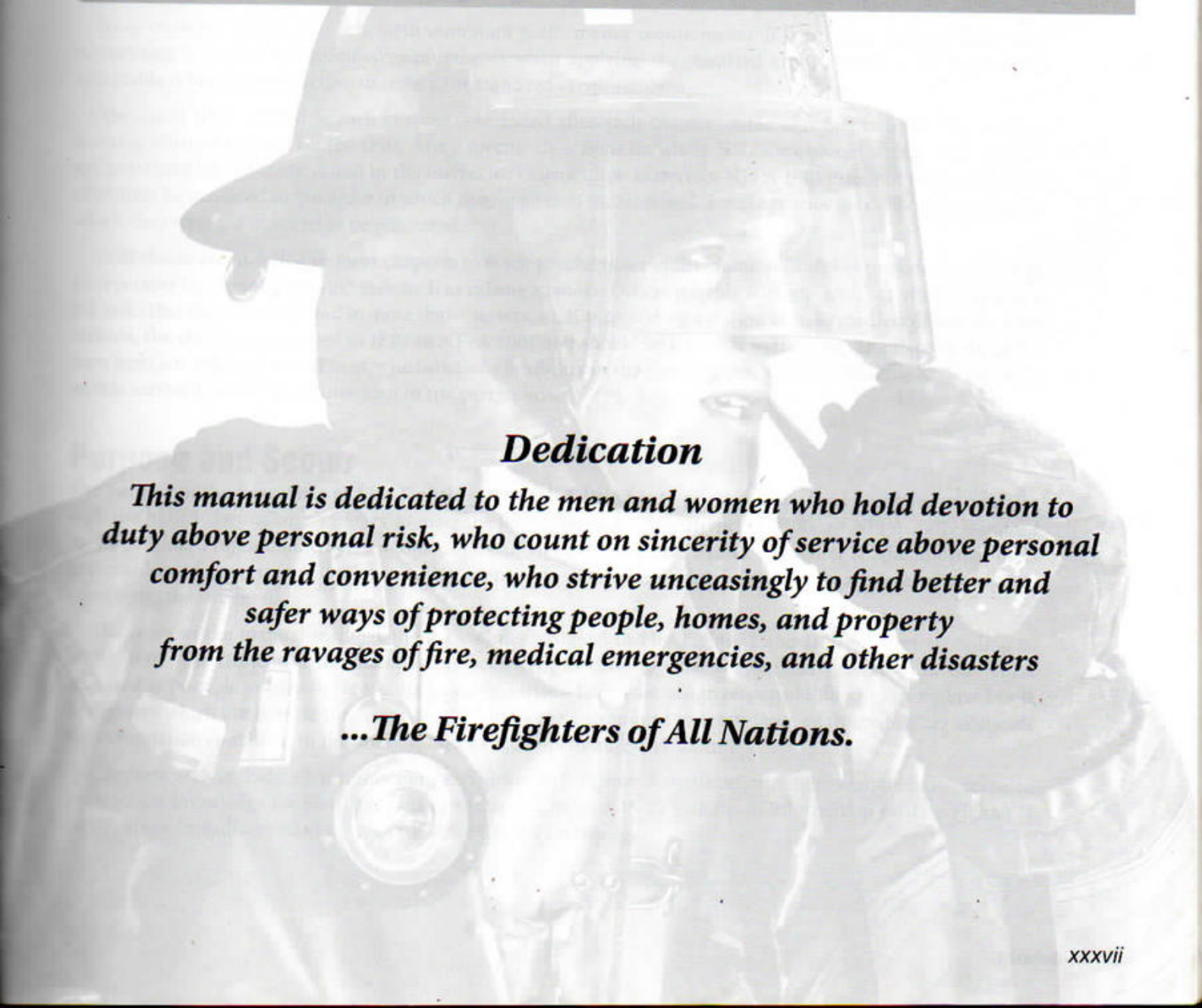


Dedication

This manual is dedicated to the men and women who hold devotion to duty above personal risk, who count on sincerity of service above personal comfort and convenience, who strive unceasingly to find better and safer ways of protecting people, homes, and property from the ravages of fire, medical emergencies, and other disasters

...The Firefighters of All Nations.

Introduction

In 1977, Fire Protection Publications (FPP) and the International Fire Service Training Association (IFSTA) published the first edition **Essentials of Fire Fighting** to provide firefighters with the highest quality of training materials possible. This **Seventh Edition** of the manual continues the tradition of quality begun with that first publication. This edition contains all of the information needed to meet the Fire Fighter I, Fire Fighter II, emergency medical care, and hazardous materials responder job performance requirements (JPRs) of the National Fire Protection Association's (NFPA) Standard 1001, *Standard for Fire Fighter Professional Qualifications, 2019 Edition.*

Keep in mind, NFPA 1001 sets forth *minimum* performance requirements. It is perfectly acceptable for any jurisdiction to exceed the specified requirements when applying the standard locally. What is not considered acceptable is for any jurisdiction to reduce the standard's requirements.

The list of JPRs covered in each chapter is included after each chapter's table of contents, as are the chapter learning objectives based on the JPRs. More specific directions on where JPRs are covered within each chapter are contained in Appendix A and in the instructor's curriculum materials. NFPA 1001 does not require that the objectives be mastered in the order in which they appear in the standard. Local agencies may choose the order in which they wish the material to be presented.

Skill sheets are included in most chapters to teach psychomotor skills. Some skill sheets provide step-by-step instructions for completing a job task such as raising a ladder. Others provide students with activities to practice job tasks that may be completed in more than one way, such as providing a station tour. Regardless of how they are written, the skill sheets are tied to JPRs in NFPA 1001 and should be included in training. The steps in the skills have been left relatively broad to give jurisdictions flexibility in the way they teach skills. The skill sheets included in this textbook match those provided in the curriculum.

Purpose and Scope

The *purpose* of the **Essentials of Fire Fighting, Seventh Edition** is to provide entry-level firefighter candidates with the basic information necessary to meet the job performance requirements (JPRs) of NFPA 1001, *Standard for Fire Fighter Professional Qualifications, 2019 Edition* for Fire Fighter I and Fire Fighter II. The information is presented in a format that will allow training agencies to develop training programs for each level or a program combining the two levels.

The *scope* of the manual includes the basic duties assigned to Fire Fighter I and II firefighters according to NFPA 1001. The content of this manual has been kept as close to what is specifically required in the NFPA standard as possible to keep the scope manageable. Jurisdictions who assign responsibilities to Fire Fighter I or II firefighters which are outside the scope of NFPA 1001 are encouraged to teach these additional duties alongside the information contained in this manual and its accompanying curriculum.

Chapters 1-15 include all information needed for Fire Fighter I certification. These chapters also serve as prerequisite knowledge for Fire Fighter II candidates. Chapters 16-22 include all information for Fire Fighter II certification, including areas for review of Fire Fighter I knowledge.

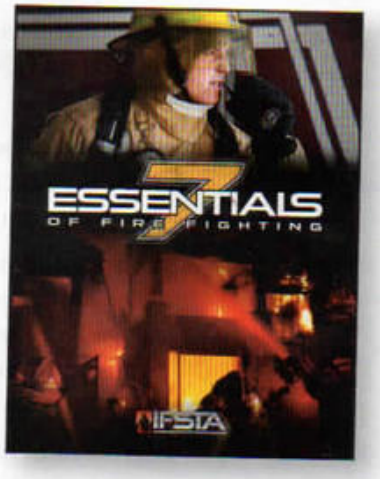
Chapter 23 contains information about basic medical care explicitly listed in NFPA 1001. It is anticipated that jurisdictions will provide additional training to firefighters to meet the requirements for emergency medical services (EMS) in the jurisdiction.

In addition, NFPA 1001 requires Fire Fighter I candidates to meet the requirements for First Responder at the Operational Level of NFPA 1072, *Standard for Hazardous Materials/Weapons of Mass Destruction Emergency Response Personnel Professional Qualifications, 2017 Edition*. The information needed to meet these requirements is included in Chapters 24-26.

NOTE: Chapters 24-26 also meet competency requirements of NFPA 472.

The methods shown throughout this manual have been validated by the International Fire Service Training Association (IFSTA) as accepted methods for accomplishing each task or skill. However, they should not be interpreted as the only acceptable methods. Local agencies may specify a locally preferred method for performing these tasks and may teach those methods as alternatives to those included in this manual.

Book Organization



This manual is separated into four sections. Sections A and B separate knowledge and skills into Fire Fighter I and Fire Fighter II sections. The intent of this separation is to give training organizations and instructors the option to teach standalone Level I or Level II courses. The entire book can be taught in courses where Levels I and II are taught together.

Section C contains one chapter explaining basic emergency medical service (EMS) information for recruit fire fighters. This chapter is limited to the topics explicitly listed in NFPA 1001. Jurisdictions should provide additional training to recruit firefighters to meet their local requirements for EMS training.

Section D includes three chapters that provide hazardous materials response training. These chapters are written to NFPA 1072, 2017 Edition. The information is limited to those sections of 1072 included as requirements in NFPA 1001:

- Awareness level responder
- Operations level responder
- Hazardous materials personal protective equipment
- Product control

Finally, Chapter 27 includes NIMS-ICS 100 and 200 information. That chapter is applicable to both Level I and Level II firefighters.

The manual chapters are arranged as follows:

Section A: Fire Fighter I

1 Introduction to the Fire Service and Firefighter Safety
2 Communications
3 Building Construction
4 Fire Dynamics
5 Firefighter Personal Protective Equipment
6 Portable Fire Extinguishers
7 Ropes and Knots
8 Ground Ladders

9 Forcible Entry

10 Structural Search and Rescue

11 Tactical Ventilation

12 Fire Hose

13 Hose Operations and Hose Streams

14 Fire Suppression

15 Overhaul, Property Conservation, and Scene Preservation

Section B: Fire Fighter II

16 Building Materials, Structural Collapse, and Effects of Fire Suppression

17 Technical Rescue Support and Vehicle Extrication Operations

18 Foam Fire Fighting, Liquid Fires, and Gas Fires

19 Incident Scene Operations

20 Fire Origin and Cause Determination

21 Maintenance and Testing Responsibilities

22 Community Risk Reduction

Section C: Emergency Medical Care

23 First Aid Provider

Section D: Hazardous Materials Response for Firefighters

24 Identifying Hazardous Materials and Their Potential Hazards

25 Action Options and Response Objectives

26 Personal Protective Equipment, Product Control, and Decontamination

Section E: NIMS-ICS

27 National Incident Management System – Incident Command Structure

Appendix A Chapter and Page Correlation to NFPA 1001 and NFPA 1072

Terminology

This manual is written with a global, international audience in mind. For this reason, it often uses general descriptive language in place of regional- or agency-specific terminology (often referred to as *jargon*). Additionally, in order to keep sentences uncluttered and easy to read, the word *state* is used to represent both state and provincial level governments (or their equivalent). This usage is applied to this manual for the purposes of brevity and is not intended to address or show preference for only one nation's method of identifying regional governments within its borders.

Key Information

Various types of information in this book are given in shaded boxes marked by symbols or icons. See the following definitions:

Safety Alert

Safety alert boxes are used to highlight information that is important for safety reasons. (In the text, the title of safety alerts will change to reflect the content.)

Information

Information boxes give facts that are complete in themselves but belong with the text discussion. It is information that needs more emphasis or separation. (In the text, the title of information boxes will change to reflect the content.)

What This Means to You

These boxes take information presented in the text and synthesize it into an example of how the information is relevant to (or will be applied by) the intended audience, essentially answering the question, "What does this mean to you?"

A **key term** is designed to emphasize key concepts, technical terms, or ideas that firefighters need to know. Definitions for key terms are included at the end of every chapter, listed in alphabetical order. The source for the definitions of fire-and-emergency-services-related terms is the IFSTA **Fire Service Orientation and Terminology** manual.

Key term as seen in Chapter:

Many modern fire departments take an **all-hazard concept** approach and provide such services as:

- Community risk reduction (fire prevention and public education)
- Fire suppression
- Fire cause determination
- Emergency medical services (EMS)
- Technical rescue services
- Hazardous materials mitigation
- Airport and/or seaport protection
- Emergency management services

Key term definition at End of Chapter:

All-Hazard Concept — Provides a coordinated approach to a wide variety of incidents; all responders use a similar, coordinated approach with a common set of authorities, protections, and resources.

Three key signal words are found in the book: **WARNING, CAUTION,** and **NOTE.** Definitions and examples of each are as follows:

- **WARNING** indicates information that could result in death or serious injury to firefighters. See the following example:

WARNING: Do not approach downed power lines until the electric company has shut off the power.

- **CAUTION** indicates important information or data that firefighters need to be aware of in order to perform their duties safely. See the following example:

> **CAUTION:** The use of water or water-based agents on Class D fires will cause the fire to react violently, emit bits of molten metal, and could injure nearby firefighters.

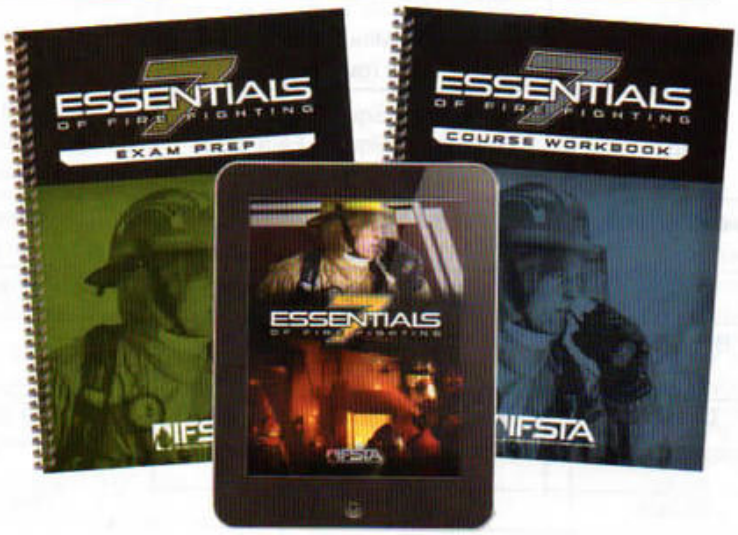
- **NOTE** indicates important operational information that helps explain why a particular recommendation is given or describes optional methods for certain procedures. See the following example:

NOTE: Some fire and emergency service organizations that have adopted two-way couplings for their supply hose operations use permanent adapters installed on hydrants for fire hydrant connections.

Chapter End Notes refer the reader to sources referenced within the chapter. Not all chapters have Chapter End Notes as they are only included when appropriate to do so.

Kerber, Stephen. 2012. "Analysis of One and Two-Story Single Family Home Fire Dynamics and the Impact of Firefighter Horizontal Ventilation," Underwriters' Laboratories. Accessed Online.

To find curriculum or study materials associated with this manual and its contents, please go to **ifsta.org** and use the search tool in the shop to find accompanying products. You can also search for IFSTA apps using your smartphone or tablet device.



Metric Conversions

Throughout this manual, U.S. units of measure are converted to metric units for the convenience of our international readers. Be advised that we use the Canadian metric system. It is very similar to the Standard International system, but may have some variation.

We adhere to the following guidelines for metric conversions in this manual:

- Metric conversions are approximated unless the number is used in mathematical equations.
- Centimeters are not used because they are not part of the Canadian metric standard.
- Exact conversions are used when an exact number is necessary such as in construction measurements or hydraulic calculations.
- Set values such as hose diameter, ladder length, and nozzle size use their Canadian counterpart naming conventions and are not mathematically calculated. For example, 1½ inch hose is referred to as 38 mm hose.

The following two tables provide detailed information on IFSTA's conversion conventions. The first table includes examples of our conversion factors for a number of measurements used in the fire service. The second shows examples of exact conversions beside the approximated measurements you will see in this manual.

U.S. to Canadian Measurement Conversion

Measurements	Customary (U.S.)	Metric (Canada)	Conversion Factor
Length/Distance	Inch (in) Foot (ft) [3 or less feet] Foot (ft) [3 or more feet] Mile (mi)	Millimeter (mm) Millimeter (mm) Meter (m) Kilometer (km)	1 in = 25 mm 1 ft = 300 mm 1 ft = 0.3 m 1 mi = 1.6 km
Area	Square Foot (ft^2) Square Mile (mi^2)	Square Meter (m^2) Square Kilometer (km^2)	1 ft^2 = 0.09 m^2 1 mi^2 = 2.6 km^2
Mass/Weight	Dry Ounce (oz) Pound (lb) Ton (T)	gram Kilogram (kg) Ton (T)	1 oz = 28 g 1 lb = 0.5 kg 1 T = 0.9 T
Volume	Cubic Foot (ft^3) Fluid Ounce (fl oz) Quart (qt) Gallon (gal)	Cubic Meter (m^3) Milliliter (mL) Liter (L) Liter (L)	1 ft^3 = 0.03 m^3 1 fl oz = 30 mL 1 qt = 1 L 1 gal = 4 L
Flow	Gallons per Minute (gpm) Cubic Foot per Minute (ft^3/min)	Liters per Minute (L/min) Cubic Meter per Minute (m^3/min)	1 gpm = 4 L/min 1 ft^3/min = 0.03 m^3/min
Flow per Area	Gallons per Minute per Square Foot (gpm/ft^2)	Liters per Square Meters Minute (L/(m^2.min))	1 gpm/ft^2 = 40 L/(m^2.min)
Pressure	Pounds per Square Inch (psi) Pounds per Square Foot (psf) Inches of Mercury (in Hg)	Kilopascal (kPa) Kilopascal (kPa) Kilopascal (kPa)	1 psi = 7 kPa 1 psf = .05 kPa 1 in Hg = 3.4 kPa
Speed/Velocity	Miles per Hour (mph) Feet per Second (ft/sec)	Kilometers per Hour (km/h) Meter per Second (m/s)	1 mph = 1.6 km/h 1 ft/sec = 0.3 m/s
Heat	British Thermal Unit (Btu)	Kilojoule (kJ)	1 Btu = 1 kJ
Heat Flow	British Thermal Unit per Minute (BTU/min)	watt (W)	1 Btu/min = 18 W
Density	Pound per Cubic Foot (lb/ft^3)	Kilogram per Cubic Meter (kg/m^3)	1 lb/ft^3 = 16 kg/m^3
Force	Pound-Force (lbf)	Newton (N)	1 lbf = 0.5 N
Torque	Pound-Force Foot (lbf ft)	Newton Meter (N.m)	1 lbf ft = 1.4 N.m
Dynamic Viscosity	Pound per Foot-Second (lb/ft.s)	Pascal Second (Pa.s)	1 lb/ft.s = 1.5 Pa.s
Surface Tension	Pound per Foot (lb/ft)	Newton per Meter (N/m)	1 lb/ft = 15 N/m

Conversion and Approximation Examples

Measurement	U.S. Unit	Conversion Factor	Exact S.I. Unit	Rounded S.I. Unit
Length/Distance	10 in	1 in = 25 mm	250 mm	250 mm
	25 in	1 in = 25 mm	625 mm	625 mm
	2 ft	1 in = 25 mm	600 mm	600 mm
	17 ft	1 ft = 0.3 m	5.1 m	5 m
	3 mi	1 mi = 1.6 km	4.8 km	5 km
	10 mi	1 mi = 1.6 km	16 km	16 km
Area	36 ft^2	1 ft^2 = 0.09 m^2	3.24 m^2	3 m^2
	300 ft^2	1 ft^2 = 0.09 m^2	27 m^2	30 m^2
	5 mi^2	1 mi^2 = 2.6 km^2	13 km^2	13 km^2
	14 mi^2	1 mi^2 = 2.6 km^2	36.4 km^2	35 km^2
Mass/Weight	16 oz	1 oz = 28 g	448 g	450 g
	20 oz	1 oz = 28 g	560 g	560 g
	3.75 lb	1 lb = 0.5 kg	1.875 kg	2 kg
	2,000 lb	1 lb = 0.5 kg	1 000 kg	1 000 kg
	1 T	1 T = 0.9 T	900 kg	900 kg
	2.5 T	1 T = 0.9 T	2.25 T	2 T
Volume	55 ft^3	1 ft^3 = 0.03 m^3	1.65 m^3	1.5 m^3
	2,000 ft^3	1 ft^3 = 0.03 m^3	60 m^3	60 m^3
	8 fl oz	1 fl oz = 30 mL	240 mL	240 mL
	20 fl oz	1 fl oz = 30 mL	600 mL	600 mL
	10 qt	1 qt = 1 L	10 L	10 L
	22 gal	1 gal = 4 L	88 L	90 L
	500 gal	1 gal = 4 L	2 000 L	2 000 L
Flow	100 gpm	1 gpm = 4 L/min	400 L/min	400 L/min
	500 gpm	1 gpm = 4 L/min	2 000 L/min	2 000 L/min
	16 ft^3/min	1 ft^3/min = 0.03 m^3/min	0.48 m^3/min	0.5 m^3/min
	200 ft^3/min	1 ft^3/min = 0.03 m^3/min	6 m^3/min	6 m^3/min
Flow per Area	50 gpm/ft^2	1 gpm/ft^2 = 40 L/(m^2.min)	2 000 L/(m^2.min)	2 000 L/(m^2.min)
	326 gpm/ft^2	1 gpm/ft^2 = 40 L/(m^2.min)	13 040 L/(m^2.min)	13 000L/(m^2.min)
Pressure	100 psi	1 psi = 7 kPa	700 kPa	700 kPa
	175 psi	1 psi = 7 kPa	1225 kPa	1 200 kPa
	526 psf	1 psf = 0.05 kPa	26.3 kPa	25 kPa
	12,000 psf	1 psf = 0.05 kPa	600 kPa	600 kPa
	5 psi in Hg	1 psi = 3.4 kPa	17 kPa	17 kPa
	20 psi in Hg	1 psi = 3.4 kPa	68 kPa	70 kPa
Speed/Velocity	20 mph	1 mph = 1.6 km/h	32 km/h	30 km/h
	35 mph	1 mph = 1.6 km/h	56 km/h	55 km/h
	10 ft/sec	1 ft/sec = 0.3 m/s	3 m/s	3 m/s
	50 ft/sec	1 ft/sec = 0.3 m/s	15 m/s	15 m/s
Heat	1200 Btu	1 Btu = 1 kJ	1 200 kJ	1 200 kJ
Heat Flow	5 BTU/min	1 Btu/min = 18 W	90 W	90 W
	400 BTU/min	1 Btu/min = 18 W	7 200 W	7 200 W
Density	5 lb/ft^3	1 lb/ft^3 = 16 kg/m^3	80 kg/m^3	80 kg/m^3
	48 lb/ft^3	1 lb/ft^3 = 16 kg/m^3	768 kg/m^3	770 kg/m^3
Force	10 lbf	1 lbf = 0.5 N	5 N	5 N
	1,500 lbf	1 lbf = 0.5 N	750 N	750 N
Torque	100	1 lbf ft = 1.4 N.m	140 N.m	140 N.m
	500	1 lbf ft = 1.4 N.m	700 N.m	700 N.m
Dynamic Viscosity	20 lb/ft.s	1 lb/ft.s = 1.5 Pa.s	30 Pa.s	30 Pa.s
	35 lb/ft.s	1 lb/ft.s = 1.5 Pa.s	52.5 Pa.s	50 Pa.s
Surface Tension	6.5 lb/ft	1 lb/ft = 15 N/m	97.5 N/m	100 N/m
	10 lb/ft	1 lb/ft = 15 N/m	150 N/m	150 N/m